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HISTORICAL SKETCH OF THE SCIENCE OF BOTANY IN NORTH AMERICA FROM 1635 TO 1840.

BY FREDERICK BRENDEL.

A HISTORY of the science of botany in North America means not in this sketch a history of that science in all its branches, but rather the history of traveling and local collectors, and of descriptive botany so far as it concerns American plants. For until Prof. A. Gray's popular book, "How Plants Grow" appeared in 1858, not a single work of any importance was published in this country, either on anatomy or on the physiology of plants, not even a single one of the many systems ever proposed had its origin in America. And yet the labors of American and foreign scientists in America contributed their large share to the advancement of science. They furnished the material for the work in all the other branches of botany, and particularly in the geography of plants. Most of them did a toilsome work, exposed in the wilderness to manifold fatigues and perils; many died far from home on the glorious battlefield of science, as it were, sword in hand; some a violent death, others swept away by a pernicious climate.

1635–1800.—It was in 1635 that the first book on North American plants ever written, was published by Jacques Philippe Cornut, a French physician. He described Canadian plants brought over to Europe, in a book entitled: *Canadensium Plantarum Historia.* It is illustrated by good drawings, most of the species being recognizable at first sight, though the names given are quite different from those now in use. But the work does not contain, as might be inferred from the title, Canadian plants only, but also some others from Spain and the Orient. Not until thirty-seven years afterward, in 1672, was another account of American plants given by John Josselyn, in a book entitled *Rariora Novæ Angliæ,* and in 1674, in an account of two voyages in New England.

At the same time, in 1672, Wm. Hughes published in London, The American Physician, or a Treatise of the Roots, Plants, etc.

In Ray's Historia Plantarum, 1688, second volume, we find a "Catalogus plantarum in Virginia observatarum," by John Banister, an English missionary and botanist, who came, in 1680, to Virginia, where he made his collections. The same catalogue was republished, in 1707, in Petiver's Memoirs for the Curious. About the same time an Englishman, Wm. Vernon, and a German, David Krieg, collected, in Maryland, several hundred new species, which they sent to Ray, Petiver, Sir Hans Sloane and others.

James Petiver, a London apothecary, described, in 1706, in "Pterigraphia Americana," some North American ferns, and Leonard Pluckenet, a London physician who lived from 1642 to 1706, figured many North American plants in "Almagestum Botanicum," 1696, and "Almatheum Botanicum," 1705.

The same year came the English naturalist, John Clayton, (1685-1773), to Virginia, where he made his collections, afterwards described by Gronovius, a distinguished Dutch botanist at the University of Leyden, in Holland. His "Flora Virginica Exhibens Plantas, quas J. Clayton in Virginia collegit," was published in 1743, and a second edition by Gronovius, the son, 1762, augmented by observations of Clayton, Colden, Mitchell and Kalm.

From 1712 to 1719, Mark Catesby, another English naturalist, collected in Virginia. A second time he started from England and arrived, in 1722, in South Carolina. He traveled three years in that State, in Georgia and Florida, visited the Bahamas and came back to England in 1726, where he published from 1731 to 1743, the valuable work, "The Natural History of Carolina, Florida and the Bahama islands," two volumes in folio and a supplement with two hundred and twenty colored plates. The descriptions are in English and French; a German edition was published in 1750. After his death (1749) was published his Hortus Britano-Americanus, in which he described the trees and shrubs of the British colonies in North America adapted to the soil and climate of England. London, 1763.

Here may be mentioned a natural history of North Carolina, by Brickell, in Dublin, 1737.

The Swedish naturalist, Peter Kalm, explored the eastern part of Pennsylvania, New Jersey, New York and Canada during the years 1748 to 1751. He was sent by the Swedish government at the proposal of Linnæus, whose pupil he was. The original motive was the American mulberry (*Morus rubra*), which was known to grow as far north as Canada, in a climate similar to that of Sweden. It was intended to acclimatize the tree and to introduce the culture of the silkworm in Sweden. The extensive botanical collections were worked up by Linnæus and embodied in his herbarium, where they exist yet.

Linnæus published, 1753, the first edition of his "Species Plantarum," in which he described 5938 species, all that was known at that time, and of which 5323 were phænogamous. In all his writings the number of species he was acquainted with was 8551 (7728 phænogamous and 825 cryptogamous). Amongst these are 1075 species either common to the eastern and western continents or only North American, inclusive of the Arctic regions and exclusive of Mexico.

Another contributor to the herbarium of Linnæus was Cadwallader Colden, Lt. Governor of New York, who was born in Scotland, 1688, and died in New York, 1776. The catalogue of his collection is published in "Acta Societatis Scientiarum Upsalensis, 1743–1744. His daughter, Miss Jenny Colden, wrote a Flora of New York, with drawings, the manuscript of which she transferred, before her death, to Wangenheim; afterwards it was incorporated into the Banksian Library, but never published.

Some Canadian plants were described by the French missionary, Xavier de Charlevoix, in his "Histoire et description générale de la nouvelle France, 1744." About the same time, John Bartram (born 1701, died 1777 in Philadelphia) traveled to Lake Ontario, and published his valuable observations in 1751. His son, Wm. Bartram (1739–1823), was the first to extend his botanical excursions to the Southern Alleghanies. He left Philadelphia in 1773, traveled through Florida and Georgia to the Cherokee country, and went through Alabama to Mobile in 1776. He published his voyage in Philadelphia, 1791. This valuable work was afterwards translated into the German, in 1794, and in French, in 1799.

John Mitchell, an American physician in Virginia, published additions to Linnæus' first edition of Genera Plantarum in his "Dissertatio de Principiis Botanicorum."

Reinhold Forster, naturalist to Cook's second expedition, compiled a catalogue of the plants of North America, in 1771, without descriptions.

A number of species, common to the Southern States and the West Indies, were made known by the important discoveries of Chas. Plumier (1690–1695), of Nic. Jos. de Jacquin (1754–1759) and of Olaf Swartz (1785–1789). Only the latter spent a year on the North American continent before he went to the West Indies, where he alone discovered and described 850 new species. The first came from France, the second from Germany, the last from Sweden.

At that time Humphrey Marshall made the woody plants his special study. He published his "Arboretum Americanum," containing 276 species, in Philadelphia, 1785, which in 1788 was republished in Germany. The German foresters took a special interest in the matter, as many American woody plants had already found their way into the German nurseries, and by some experiments made it was known that for many purposes some sorts of American timber were superior to the indigenous, and as the greater demand for fuel in some industrial districts resulted in a final scarcity of wood, they thought that the cultivation of American timber in the German forests would be, by its more rapid growth, of great advantage.

Captain[1] Wangenheim, of the Hessian troops, afterwards Prussian forest-officer, studied, during his eight years service in America, the timber of this country with regard to its usefulness and practicability of culture. In 1781 he published descriptions of some North American trees, and after his return to Germany a larger work with drawings, 1787. There are many good observations on the soil and climate and their influence upon the culture of the different species, but the drawings are inferior, and in one there is a great error which is worthy of notice. On plate 18 is figured the leaf of *Carya olivæformis* and what is intended to represent its fruit, but looks rather like a pea nut. Probably he had never seen the nut, which he described as "kidney shaped," though he examined, in Wm. Prince's nursery at Flushing, on Long Island, the young tree not yet bearing. As he was eager to obtain the fruit, somebody by mistake, or perhaps for jest, may have given to him a pea nut for a pecan nut, which he drew. He gives a short history of the tree, which was unknown in the English colonies until the peace of 1762, when by chance some fur-traders brought a small number of the nuts to New York. Wm. Prince planted (1772) thirty nuts and raised ten plants, which (except two retained for propagation) he sold to England at ten guineas a piece.

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[1] Here may be corrected an error in the preface of Torrey's Flora of New York. Wangenheim was not a surgeon nor an M. D.

In 1783, was sent over to America from Vienna, a scientific expedition under the charge of Prof. Marter, assisted by Dr. Stupicz, two gardeners and one designer. From Philadelphia they made excursions in Pennsylvania, to Virginia and Carolina. In the latter State, Marter met Dr. Schoepf, surgeon in the service of the Margrave of Ansbach, another German petit-tyrant who sold his poor subjects to the English. Both made together an excursion to Florida and the Bahamas. Marter brought large collections to Vienna, and Dr. Schoepf afterwards published a "Materia Medica Americana," Erlangen, 1787, and his "Travels Through the North American States," Erlangen, 1788.

An Italian nobleman, Luigi Castiglioni, traveled from 1785 to 1787 in the Eastern States, and published, 1790, his "Viaggio negli Stati Uniti del America Settentrionale," in two volumes. The latter half of the second volume contains observations on the useful plants. Like Wangenheim he gives to his countrymen some hints in regard to acclimatation. He describes most of the eastern and southern woody plants and gives a few good drawings (*Franklinia alatamaha* of Marshall, now *Gordonia pubescens*, *Quercus banisteri* and *Rhus venenata*). He made himself acquainted with the scientific men of the country, and in a passage (p. 163 second volume) where he objects to the assertion of Raynal (Histoire Philosophique et Politique), that America has never produced a single prominent man, be it in science, art or any other branch, he names, after mentioning a number of military, political and scientific men, the botanists, John Bartram and sons, Humphrey Marshall, Manasseh Cutler and Dr. James Greenway of Virginia, who made valuable collections.

Thomas Walter, the author of the Flora Caroliniana, published in London, 1787, was born, 1740, in Hampshire in England. He made his collections on a small area of scarcely more than twenty-five square miles on the Santee river, in South Carolina, but though he declares his collection very incomplete, it contains over a thousand species. He is a most modest man and not an over hasty species-maker. Whenever he is in doubt about a species he does not name it, but calls it "anonymous," for only few, he says in the preface, are allowed to name, and so he concedes to those who are the leaders in science, the right to name those plants now first described. To his name on the title he appends "agricola" (farmer), a learned farmer indeed, as the whole book is written in Latin. In front of the book is a copperplate (representing *Magnolia frazeri* Walt.) with the inscription: "To Thomas Walter, Esq., this plate of the new auriculated Magnolia is presented as a testimony of gratitude and esteem by his much obliged humble servant, John Fraser."

This man, John Fraser, was a Scotch botanist who collected from 1780 to 1784 in New Foundland, and from 1785 to 1796 in the United States. After a voyage in Russia he came again to America with his eldest son, John, in 1799. He visited the Alleghanies, where before, in 1789, he had traveled with Michaux, and on the summit of the Great Roan it was that he discovered the beautiful *Rhododendron catawbiense*, now cultivated in many varieties. After a visit on the island of Cuba, where he met Humboldt and Bonpland, father and son returned to England in 1802. Once more, 1807, both came to North America. The elder Fraser died, 1811, in Glasgow, but his son returned to America, where he continued his excursions up to 1817.

Palisot de Beauvais (1755–1820) came from St. Domingo to Philadelphia in 1791. He extended his excursions to the Cherokee country in the Southern Alleghanies. Of his collections, a large part was lost by shipwreck.

L. A. G. Bosc (1759–1828), a friend of Michaux, came from France to Charleston, in 1798, made some excursions in the vicinity of that city, traveled northward to Wilmington, N. C., and westward to the line of Tennessee. With a collection of 1600 species, chiefly grasses and cryptogamous plants, he returned in 1800, to France. Parts of his collection are found in the herbaria of Ventenat, Martius, Moretti and De Candolle.

Another Frenchman ought to be mentioned here not as a botanist, but because the matter he treated of is in near relation to botany. The Count Volney came to North America as an exile in 1795, and lived there till 1798. He had traveled previously in the Orient and had written the famous work, "The Ruins." In America he studied the soil and the climate. His "Tableau du climat et du sol des Etats Unis d'Amerique," was published in Paris, 1822. Though we cannot agree with all he said, particularly not with the statement that the ancient and annual fires of the Indians *caused* the prairies, the book contains much interesting matter. In the second chapter he describes, in general, the appearance of the country, particularly the extensive woodlands, which he brings into three categories, as the southern, the middle and the northern, each characterized by its peculiar trees. Very interesting to Western men is his article on the colony at Vincennes, on the Wabash, and the early French life in Illinois.

The most important collections of this period were made by André Michaux, born in France, 1746. Before Michaux came to this country, he had traveled in Persia, 1782 to 1785. Then, in September, 1785, he embarked for New York, where he arrived in November of the same year. He established two gardens, one in New Jersey, the other near Charleston, S. C., for he was sent by the French government to collect living plants, to be transported to France. His excursions extended from Canada to Florida, and, in the west, to the Mississippi; farther than any collector before him had traveled. From Charleston he started for his first tour to the southern Alleghanies, in April, 1787, and returned the 1st of July; went to Philadelphia and New York, and returned to Charleston in August. Then, in February, 1788, he embarked for St. Augustine, Florida; returned to Charleston, and started again for the Alleghanies. During the following winter he was on the Bahama islands, and brought back to Charleston eight hundred and sixty young trees and shrubs. Then he made several excursions to the Alleghanies of North Carolina, through the valley of Virginia to Maryland and Pennsylvania. From New York he returned to South Carolina, via Baltimore, Richmond and Wilmington, and went again to the mountains. He returned to his nursery with twenty-five hundred young trees, besides many shrubs and other plants. In March, 1792, he sold his nursery near Charleston, and went to Philadelphia, collected in New Jersey and around New York; traveled via Albany and the Champlain lake to Montreal and Quebec, and came back from there to Philadelphia in December.

In July, 1793, he undertook his great journey to the far west; he crossed the Alleghanies of Pennsylvania, descended the Ohio to Louisville; crossed Kentucky and Virginia, back to Philadelphia. In 1794 he visited again the Southern States; in May, 1795, he was in East Tennessee, crossed the Cumberland mountains, arrived, in July, at Louisville, traveled the Wabash up to Vincennes, crossed Illinois, descended the Mississippi in a little boat to the mouth of the Ohio, followed the Cumberland river up to Clarksville, and arrived, via Louisville and North Carolina, at Charleston in August, 1796.

His travels in the Alleghanies are more particularly spoken of by Prof. Asa Gray, in his "Notes of a botanical excursion to the mountains of North Carolina." He had already sent to France more than sixty thousand living woody plants, and forty boxes with seeds, when he returned in 1796. Unfortunately, he suffered shipwreck off the coast of Holland, but he, and the collections which he brought, were saved, though the latter were damaged. He arrived at Paris in December, 1796, and published, in 1801, his great work on the American oaks, with excellent engravings. He then prepared the material for his Flora Boreali-Americana, but did not live to see it published.

Though he had desired to return to America, he accepted a proposition of Captain Baudin, to take part in an expedition to New Holland, and embarked on the 18th of October, 1801. Arrived in Isle de France, he left the expedition for Madagascar, where a malignant fever caused his death, on the 13th of November, 1802.

Louis Claude Richard arranged the material of his Flora, and, in 1803, it was published by François André Michaux, the son. In this work are described 596 genera (555 vascular and 41 cellular) and 1740 species (1641 vascular and 99 cellular). Though many changes and reductions have been made in the course of time, 17 of the genera, proposed by him as new, are valid yet, and about 350 species.

Considering the vast area he traveled over, often without company, the poor facilities for traveling at that time, the troubles he had to undergo in transporting so many living trees and shrubs, the dangers he had to fear, risking his scalp at every step in the Western wilderness, we must admire that indefatigable traveler. His name stands as a prominent landmark at the dividing line of two periods, from which the labors of working botanists in this country took a new departure.

1800—1840.—Till then, at the close of the eighteenth century, as we have seen, most of the work was done by foreigners, partly engaged by European institutions or by private men. The few Americans did the work at their own expense, for there was no subvention by the Government at that time. Michaux, after his return from Canada, had, in 1792, entered into negotiation with the Government about an expedition across the continent, but without any result. Indeed, the Union, with her four millions of inhabitants, was not a rich country at that time; she could not support scientific pursuits with the same liberality as she, in our times, does with her forty millions. And yet, ten years afterwards, an expedition was sent out under the command of Meriwether Lewis and Daniel Clark, the first that ever crossed the continent.

Before this expedition, only two botanists had visited the Pacific coast, Haenke and Menzies.

Thaddaeus Haenke (1761-1817), botanist with the Spanish expedition under Malaspina, collected about nine thousand species, of which a small part were from Northern California, in 1789. The herbarium is in the National Museum of Bohemia. Haenke did not return to Europe, but settled at Cochabamba, in Bolivia, where he died, 1817. Presl published the description of a part of his collections, under the title: Reliquiæ Haenkeanæ; 2 vols., with 72 plates. Here, by-the-by, may be corrected a geographical error, such as may often be found in learned writings. In Kunth's Enumeratio, vol III, page 361, under Juncus falcatus, we read: a Haenke lectus prope Monte Real (Canada). But Haenke was never in Canada, and it is meant Monterey, in California.

Archibald Menzies (1754-1842), a Scotchman, surgeon in the British marine, came first, 1786, to the North-west coast, and made there some collections. Afterwards, he took part in the famous expedition under the command of Vancouver (1791-95), and visited, several times, San Francisco, Monterey and Nutka Sound, on Vancouver Island. His collections are incorporated in the herbarium of the Edinburg Botanical Society, and, partly, in Hooker's herbarium.

This was all that was known of the botany of the northern Pacific coast, when the first American exploring expedition started from St. Louis, on the 14th of May, 1804. The party ascended the Missouri in keel-boats, cordeled by hand; wintered at Fort Mandan; crossed, in the next season, the Rocky mountains (at the Bitter-root mountains), and descended the Lewis fork and the Columbia river. The botanical collection from the Rocky mountains was, unfortunately, lost; only one hundred and fifty species, collected during the rapid return-march, were saved. These plants were described by Frederick Pursh.

The German botanist, Frederick Pursh, came to North America in 1799, a young man then, but not as young as he is made in Pritzel's Thesaurus, which, on account of so many errors in printing, is, in regard to dates, unreliable. According to Pritzel, he was born in 1794! What a young botanist, crossing the Atlantic, five years old! He was born in 1774.

"My first object after my arrival in America," he says in the preface to his Flora, "was to form an acquaintance with all those interested in the study of botany. Among these I had the pleasure to account one of the earliest, and, ever after, the most valuable, the Rev. Dr. Mühlenberg, of Lankaster, Pa., a gentleman whose industry and zeal for the science can only be surpassed by the accuracy and acuteness of his observations."

Heinrich Ludwig Mühlenberg, born 1756, was a Lutheran preacher in Lancaster, Pa., where he died, 1817. He published a catalogue of North American plants, 1813 (second edition 1818), and a "Description of North American Grasses," 1817.

Then Pursh visited Mr. Humphrey Marshall, already mentioned, the younger John Bartram and his brother William Bartram; Mr. John Lyon, who had the management of Mr. William Hamilton's gardens, and whose successor he was from 1802 to 1805, and Dr. Benjamin S. Barton, Professor of Botany in the University of Pennsylvania, who lived from 1766 to 1815, the author of "Collections for an Essay toward a Materia Medica of the United States," 1798 (second edition 1812-1814); of a "Flora Virginica," first part, 1812, but not continued, and of "Geographical view of trees and shrubs," 1809.

In 1805, Pursh set out for the Alleghanies of Virginia and Maryland; in 1806 he went to the Northern States, as far as New Hampshire; in 1807 he took charge of Professor Hosack's botanical garden of New York; in 1810 he visited the West Indian islands, and returning in 1811, landed in Maine, and embarked the same year in New York for England, where he published his Flora Americæ Septentrionalis, London, 1814, in 2 vols., with 24 engravings. This Flora contains about 740 genera and nearly 3000 species.

It will be easily understood that Pursh's Flora, which was published eleven years after Michaux's, must be richer in genera and species, when we consider that Michaux described only such species as he collected himself, and that Pursh received contributions from many parties. Except the small collection of Lewis and Clark, he used the herbaria of J. Lyon and Barton in Philadelphia, of Hosack in New York, of Le Conte in Georgia, of Peck in Massachusetts, and a number of species received from Alois Enslen, an Austrian gardener, who made large collections in the Southern States and Western territories, which are now in the Imperial Museum of Natural History in Vienna.

Then, in England, Pursh examined the herbaria of Clayton, Pallas, Plukenet, Catesby and Walter. In Bank's herbarium he found a number of the plants collected by Archibald Menzies on the North-west coast.

Pursh returned to America with the intention to explore Canada, where he died in 1820.

C. C. Robin,[1] a Frenchman, traveled, 1802-1806, in Louisiana and West Florida, which at that time included the southern parts of the States of Mississippi and Alabama. The incidents of his voyages he published in 1807, and in an appendix he described the plants, found on his tour, very vaguely, as he indeed was not a botanist. It is not known that he ever brought to France the specimens of those plants. From this written material was fabricated, by Rafinesque, a fancy work called Florula Ludoviciana, published in New York, 1817.

Constantin Samuel Rafinesque-Schmaltz is his full name. He was a Sicilian, and came to America in 1802, where he remained three years, and then again in 1815, and never returned, for he died in 1840, in this country. A. Gray published, in the American Journal of Science and Arts, a paper on his numerous botanical writings. Gray calls him an eccentric but certainly gifted man. It is true, some of his observations are really good, some of his genera and species are acknowledged now and will be in the future, but the greater part are trash; most of his numerous species can never be found, for they have no real existence in nature. He was a polygrapher—he wrote on everything; even poetry, the worst of all, he committed. At last he made a perfect fool of himself; he had such a mania for classification and registration, that he once proposed—twelve new species of thunder and lightning! His travels extended, in 1802-4, over the States of New Jersey, Pennsylvania, Maryland, Delaware and Virginia; in

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[1] Not the godfather of the genus Robinia. That was Jean Robin, who lived from 1550 to 1629, in Paris.

1815 and 1816, mostly in New York, New Jersey and Pennsylvania; 1818 to the West (Ohio, Indiana, Kentucky and Illinois). To enumerate all his publications would be a waste of time and paper.

François André Michaux (1770-1855) had already traveled with his father. In 1801 he started again for America, to explore the Western States. In June, 1802, he crossed the Alleghanies of Pennsylvania, on foot, descended the Ohio in a boat from Wheeling to Limestone; crossed Kentucky in a south-westerly direction, and Tennessee as far as Nashville, and returned via Knoxville in East Tennessee, to Charleston, S. C., where he arrived on the 18th of October, 1802.

After his return to France in 1803, he published his "Voyage a l'Ouest des monts Alleghanys," Paris, 1804. The book contains many valuable observations on vegetation, wild as well as cultivated. 1805, he published a work on the naturalization of North American forest-trees, and 1810-1813, his great work, "Histoire des arbres foréstières de l'Amerique septentrionale." There is an English translation, published in Philadelphia, 1859; The North American Sylva, three volumes, with 145 plates, uniform with Thomas Nuttall's work with the same title, published 1842-1854, which contains, in three volumes with 121 plates, those trees which are not described in Michaux's Sylva, mostly trees from the Rocky mountains, California and Florida, not known before.

Thomas Nuttall, a native of Yorkshire in England, and a printer by trade, came to America about the year 1808. He was, like Michaux, an indefatigable traveler. In company with John Bradbury, who had already explored the vicinity of St. Louis during the year 1810, he traveled, 1811, the Missouri upward to Fort Mandan; 1816, he was in the Alleghanies, in Kentucky and Ohio. On the 2d of October, 1818, he started from Philadelphia for Pittsburg, descended the Ohio to its mouth, then the Mississippi to the Arkansas river; this river upward to the Fort Smith; from there in a south-westerly direction to the Red river. After his return to Fort Smith, he followed the Arkansas farther up to the mouth of Verdegris river, and Grand river, and northward to the Osage saltworks. This latter excursion was full of hardships, disease, Indian pillaging and peril of life. Returning, he descended the Mississippi to New Orleans, where he arrived on the 18th of February, 1820.

From the manner of writing, we may often perceive the character of a man. Whoever may read his "Journal of travels into the Arkansas territory," published in Philadelphia, 1821, will be delighted at the plain, unpretending style, the "unvarnished tale," as he expresses himself in the preface, and will divine in Thomas Nuttall an amiable man.

In the years 1834 and 1835, Nuttall crossed the Rocky mountains to the Pacific coast, explored Oregon and California, made an excursion to the Sandwich islands, and returned around Cape Horn to the Atlantic coast. Besides the above-mentioned books, he published his "Genera of North American plants," in two volumes, Philadelphia, 1818; an "Introduction to systematic and physiological botany," Cambridge, 1827, and numerous descriptions of new plants, mostly in the Proceedings of the Academy of Natural Science, in Philadelphia. He died at the ripe age of seventy-three, on the 10th of September, 1859, in Lancashire in England.

Nuttall and Bradbury are mentioned by W. Irving in his Astoria, in which he describes the voyages of the parties sent out to Oregon by Mr. Astor. As both gentlemen left the expedition on the upper Missouri, these voyages had no further relation to botany.

Several other foreign botanists collected at that time in North America. Alire Raffenau Delile, professor of botany at the University of Montpellier, in France, after his return from the French Scientific Expedition in Egypt, a prominent member of which he was, came over to America and collected during three years, in the vicinity of Wilmington, N. C.

José Francisco Correa de Serra, secretary of the Royal Academy of Lisbon, came in the year 1813 to New York and Philadelphia, from where he made several excursions.

From 1817 to 1823 Mr. Milbert collected for the Museum of Natural History at Paris. He lived in New York and extended his excursions to the Ohio, Mississippi, Lake Superior and Canada.

Active American botanists of that time were Amos Eaton, professor in Albany, N. Y. He lived from 1776 to 1842, and published the first edition of his Manual of Botany, 1817, and of eight editions the last in 1841.

James Bigelow was professor of botany in Boston. His first edition of Florula Bostoniensis appeared in 1814, the third in 1840, and his American Medical Botany, 1817–1821, in three volumes with sixty colored plates.

William Baldwin, born in Pennsylvania 1779, collected in 1811, in Delaware, then in Georgia and Florida, and went, 1817, to Buenos Ayres, in South America. He died on the 31st of August, 1819, as a member of Major Long's first expedition, in Missouri. Darlington published, 1843, Reliquiæ Baldwinianæ. This expedition, by order of the Government, under the command of Major Long, started from Pittsburg in April, 1819, and proceeded the same year up the Missouri to Council Bluffs, where they wintered. Dr. Baldwin, the botanist of the expedition, sick already when the party set out from Pittsburg, died in Franklin, Mo., and Edwin James took his place, who compiled the account of the expedition in two volumes, 1823; the same year it was published in London in three volumes. The party started again on the 6th of June, 1820, from Council Bluffs, moved up the Platte river and examined the mountains from the South fork of the Platte to the Arkansas. Dr. James ascended the grand peak described by Major Pike in an account of his expedition in the years 1805–1807, which furnished no botanical matter. This peak is, in the narrative, called James' Peak; Fremont afterwards changed it to Pike's Peak, although Pike had only seen it and James was the first that ascended it. In returning, one part of the command followed the Arkansas river, the other the Canadian river. The catalogue of the collected plants, 500 to 600 species, was published by James, in 1825, in the Transactions of the American Philosophical Society, II, 172–190. James died 1861, near Burlington, in Iowa; he was born in Vermont, 1797.

In the period from 1820 to 1830 several Floræ of more or less limited parts of the United States were published. The best known are: Botany of South Carolina and Georgia, 1821–1824, in two volumes, with twelve plates, by Stephen Elliot, professor in Charleston, where he died 1830; the Flora of the Northern and Middle States, by John Torrey, 1824, and the Flora Cestrica (of Chester county, Pa.), 1826, by William Darlington, who lived from 1782 to 1863, and published the third edition of his Flora in 1853.

Lewis David v. Schweinitz, born in 1780 at Bethlehem, Pa., where he lived to 1834, published, in 1821, "Specimen Floræ

Americæ Septentrionalis Cryptogamicæ," containing the liverworts, and 1825, a Monograph of the genus Carex. He collected the fungi of Carolina, a catalogue of which, containing 1373 species, was published by Schwaegrichen, the well known cryptogamist, in Leipzig, 1822.

The catalogue of plants collected in the North-western territory during Major Long's second expedition, is written by Schweinitz. This expedition was described by Wm. H. Keating, the geologist of the party, and published in London in 1825, in two volumes, entitled, " Narrative of an Expedition to the Source of St. Peter's river, Lake Winnepeek, Lake of the Woods, etc., performed in the year 1823." The party left Philadelphia on the 30th of April, and the route of the expedition was the following: Wheeling, Fort Wayne, Chicago, Fort Crawford, Fort St. Anthony, up the St. Peter's river to its source, down the Red river to Lake Winnipeg, Rainy lake, Fort Williams on Lake Superior and return on the lakes. Edwin James was appointed botanist, but he missed the place of meeting, so Mr. Thomas Say, the zoölogist of the expedition, undertook to collect the plants. As several boxes containing collections, and dispatched during the expedition, were lost, the botanical collection was very poor, only 130 species. As poor as the collection was, the description of the species called new by Schweinitz, are mostly riddles not yet solved. So the expedition, otherwise interesting, was unimportant as to botany.

Dr. Douglass Houghton, who met, in 1845, a sad end by drowning in Lake Superior, was a member of Schoolcraft's Expedition to the sources of the Mississippi river in 1832, the narrative of which was published in 1855. He collected about 250 species of plants, only a few of which were new.

Up to this time a number of botanists were at work on the Pacific coast.

Adelbert Chamisso de Boncourt (1781–1838) and Frederik Eschscholtz (1793–1831) were commissioned by the Russian government, the one as naturalist, the other as physician, to the Russian Exploring Expedition in the Pacific and Behring straits, under the command of Kotzebue, 1815–1818, and explored Alaska and a part of the coast of California. The collections are partly in the royal herbarium at Berlin, partly in St. Petersburg.

The plants collected by Lay and Collie, of the expedition of

Capt. Beechey to the Pacific, 1825–1828, were described by Sir Wm. Jackson Hooker and G. A. Walker-Arnott, and published in London, 1841, a quarto volume with ninety-four plates. A part of these plants were collected in California.

Carl Heinrich Mertens, born in Bremen, 1796, took part in the Russian expedition under the command of Capt. Lütke, 1826–1829. Amongst his collections was a number of plants from the Island of Sitka, which, as Mertens not long after his return died in St. Petersburg, were described by Bongard in the memoirs of the Academy of Science of St. Petersburg, 1832. His account of the vegetation of Sitka was already published, 1827, in Berlin, by A. Chamisso, with observations of the same.

A member of the same expedition was F. H. v. Kittlitz, who published twenty-four fine landscape views of the Pacific islands and coasts, amongst which are four that give a good idea of the vegetative character of Alaska. Three of them are rather roughly copied in the U. S. Agricultural Report for 1868.

David Douglas, born in Scotland, 1790, traveled for the Horticultural Society of London. He arrived in July, 1823, in New York, made excursions through New York State to Canada, and returned to London 1824. The society was so well pleased with his collection that he was sent the same year to Oregon, where he arrived in February, 1825, on the same ship with Dr. John Scouler, another Scotchman, who was afterwards professor in Dublin, and died, seventy-two years old, in 1871, in Glasgow, his birthplace. Douglas took up his residence in Fort Vancouver, and made from there excursions into the interior of Oregon Territory, and to Northern California, then he crossed the Rocky mountains to the Athabasca river, and to York Factory on the shore of Hudson's bay. In October, 1827, he returned to England. In 1830 he undertook his second voyage to Oregon and Upper California, and in 1833 he crossed the Pacific to the Sandwich islands, where he lost his life in a horrible manner. It was on the 12th of July, 1834, that on an excursion he fell into a deep excavation made for the purpose of capturing wild beasts; a wild ox, plunging soon after him into the same hole, killed him. This was a time of disaster for traveling botanists. A year before Douglas, in February, 1833, Thomas Drummond died in Havana; two months only after Douglas, was Carl Beyrich taken away by the cholera at Fort Gibson, the next year Joseph Frank died in New

Orleans, and in 1837 H. B. Croom lost his life by shipwreck on the coast of North Carolina.

H. B. Croom was born in North Carolina, 1799; his catalogue of plants of Newbern, N. C., was, after his death, published by Torrey.

Joseph Frank came to America, 1835, and collected for a botanical society in Germany (the Unio Itineraria). He traveled in Pennsylvania, Ohio, Missouri and Louisiana.

Carl Beyrich, another German, was sent by the Prussian government. He collected, 1833, in North and South Carolina and Georgia 1300 species in one season. The next year he went with a military expedition (probably that of Col. Dodge) from St Louis to the Indian Territory, to leave it no more.

Thomas Drummond, brother of the well known Australian traveler, James Drummond, took part in Franklin's second expedition as an assistant of Dr. Richardson, in 1825. At Cumberland House he left the party to explore the Rocky mountains of the British Territory. In 1831 he collected in the Alleghanies, and then in the vicinity of St. Louis and New Orleans, where he embarked for Texas. He explored the country around Austin, Brazoria and Galveston, went to Apalachicola, in Florida, and started from there in February, 1833, for Havana, where he died in the month of March.

Already before Drummond, in 1827–1830 Texas was, in its more western parts, explored by Jean Louis Berlandier, from Geneva. He also, though later in 1851, died far from home in Matamoras, on the Rio Grande.

Maximilian, prince of Wied, traveled in the Western Territories in the years 1832–1834, and brought back to Germany a small collection of about two hundred species, which were published by Nees v. Esenbeck, professor of botany in Breslau. There was nothing new except the genus Sarcobatus, proposed by Nees and afterwards described again by Torrey under the name of Fremontia.

Many American botanists were at work in this period, collecting the plants about their homes or exploring the vegetation of larger districts. The most prominent ought to be named here: In Massachusetts, Bigelow, Tuckerman, Oakes, Dewey; in Connecticut, Barratt; in New York, Sartwell, Carey, Beck, Bailey; in Pennsylvania, Pickering, Durand and Darlington; in North

Carolina, M. O. Curtis; in Georgia, Boykin and Le Conte; in Florida, Chapman, Leavenworth and Blodgett; in Alabama, Gates; in Louisiana, Hale, Carpenter and Riddell, who, in 1835, published a Flora of the Western States, and afterward a Flora Ludoviciana. Other catalogues of local floras were compiled of the plants in the vicinity of Charleston, S. C., by Bachman, 1834; of the plants of Columbia, S. C., by Gibbes, 1835; of the plants near Baltimore, by Aikin, 1836. Dr. Pitcher collected in Arkansas, afterwards in Michigan; in Kentucky Dr. Peter and Prof. Short; in Illinois the same and Buckley; in Ohio, Lea and Sullivant; in Michigan, Wright; in Wisconsin, Lapham; in Missouri, Engelmann.

In the botany of the Californian survey, the first of which volume is now published, we find often the quotation of Plantæ Hartwegianæ.

Theodor Hartweg, a German gardener, was sent by the English horticultural society to Mexico and California, where he collected during the years 1838-1839. Many of the plants described and published by G. Bentham, under the above-mentioned title, in 1839-1848, occur in what was formerly the northern Mexican countries.

J. N. Nicollet, a Frenchman, employed under the Bureau of Topographical Engineers (since 1838), explored the basin of the upper Mississippi during the years 1836-1840. To his party was attached the German botanist, Carl Geyer, the large collections of whom were sent to Drs. Torrey and Gray. These two bright stars had already risen above the horizon of the botanical firmament, and commenced, at the close of the fourth decennium, their great work, the Flora of North America, opening a new epoch in the history of American botany.

The interest in the science of botany was now wide awake amongst the American public, and the Government bore its rich share of it, spending large sums for scientific purposes, by attaching scientific men to the nearly unbroken series of expeditions and surveys which were now undertaken.